
Conference Reports

Summary of UMTC2003, and an invitation to contribute to UMTC2004



written by Liz Price
Email: chair@umtc.ac.uk

The 29th annual Undergraduate Mathematics Teaching Conference (UMTC) was held at the University of Birmingham from 1st to 3rd September 2003, with 39 delegates taking part including colleagues from Lebanon and Malta. The Conference was one day shorter than in previous years, which most delegates preferred.

UMTC offers an annual opportunity to meet colleagues from different universities and exchange ideas, experiences and anecdotes about the teaching of mathematics at undergraduate level. This year was no exception. The Conference was held in the usual friendly atmosphere with informative and enjoyable plenary talks, discussion and presentation of topics from the working groups, and interesting presentations from colleagues. Delegates enjoyed a superb Conference Meal in the impressive setting of Highbury Hall, family home of Joseph Chamberlain. Feedback from attendees included comments about the “friendly atmosphere”, “the nice mix of people” and praise for the “interactive character” of the conference.

The two plenary speakers at UMTC03 were Professor Cliff Beevers OBE (Director of the CALM Project for Computer Aided Learning in Mathematics and Co-Director of the Scottish Centre for Research into On-Line Learning and Assessment, Heriot-Watt University) who spoke on *E-assessment in Mathematics* and Professor Chris Budd (Professor of Applied Mathematics at the University of Bath and Chair of Mathematics at the Royal Institution of Great Britain) with a talk on *Bath Taps Into Science*.

However, as previous delegates will know, the main focus of the Conference is the work of the small working groups whose aim is to produce a report on a “brief” concerning a current issue relating to learning and teaching in undergraduate mathematics. The briefs considered in 2003 were:

- Developing effective strategies for teaching engineering mathematics to mixed ability groups
- Sharing good practice in assessment
- Mathematics and virtual learning environments
- Mathematicians as educational co-researchers
- The probability problem

After working together for some 10 hours, each group produced a draft report on their chosen brief. These will be published in the Conference proceedings after a process of review and post-conference polishing. Also in the proceedings will be summaries of the plenary talks. Proceedings and summaries of previous Conferences can be found on the UMTC web-site www.umtc.ac.uk. Paper copies are distributed to every university mathematics department in the UK as well as

to conference delegates. In addition to the working groups, the Conference sets aside time for delegates to give presentations. Summaries of these are also published in the Conference proceedings.

This year’s Conference continued the research theme set in previous years, with the brief *Mathematicians as educational co-researchers*. The aim here was to support and discuss the work being carried out in an LTSN funded research project which sees the collaboration of mathematicians and mathematics educators analysing and reflecting upon students’ mathematical thinking [1]. Another LTSN funded project, the aim of which is to produce a set of booklets based on the LTSN Generic Centre Assessment Series but aimed directly at MSOR, also featured. As part of its remit, the working group discussing the brief *Sharing good practice in assessment* was asked to review drafts of the booklets [2].

The Organising Committee is already planning UMTC 2004. This will again be held in Birmingham, from Wednesday 1st September to Friday 3rd September 2004. We are keen to **invite ideas for themes for discussion and action** that are considered important issues by lecturers in mathematics, statistics and OR. Before submitting ideas, you may wish to consult the previous working briefs and reports on the UMTC web site. The Committee would particularly welcome topics that could develop into further action research. UMTC is committed to promoting such topics and may provide some financial support.

The following are suggestions currently being considered for UMTC 2004:

Possible plenary speaker topics:

- Post-14 inquiry
- The new Higher Education academy
- “Maths preparedness” for graduates entering industry
- National Teaching Fellowships
- Statistical education for industry

Possible Working Group briefs:

- Mathematics for computer science
- Service teaching in statistics
- Progress files: their likely impact (to be led by an advisor)

- Mathematics support and resource centres
- Subject based continued professional development
- The new Higher Education academy and the next round of subject reviews
- Teaching financial maths
- Investigative projects

The above suggestions aim to allow delegates to choose an area of interest that will help improve their performance as lecturers in a learning and teaching role, or develop their subject-specific knowledge and ideas.

The programme will not be finalised until after the Organising Committee meeting in January 2004, and we invite **any individual or mathematics related body to contribute** ideas that are felt to be important and can be

considered for inclusion at UMTC 2004. As chairperson for UMTC 2004, I would be happy to receive any such contributions preferably *before Christmas 2003*. Whatever the final programme and topics are, we hope new participants as well as experienced UMTC delegates will come and contribute to UMTC 2004. I look forward to seeing you there.

References

- [1] Nardi E (2003), *Mathematicians as educational co-researchers*, MSOR Connections **3**,3,2-3
- [2] Challis N (2002), *Supporting good practice in assessment in Maths, Stats and OR*, MSOR Connections **2**,3,4

Conference Report: 5th International Congress on Industrial and Applied Mathematics

Contributed by Chris Sangwin, University of Birmingham email: c.j.sangwin@bham.ac.uk

CIAM, one of the largest applied mathematics gatherings, took place in Sydney Australia, 7-11 July 2003. It comprised approximately 1600 contributed talks, in up to 43 parallel sessions and six embedded meetings: ASOR CTAC EMAC NSFMA/NZ MC ANZIAM. In addition to exhibitions from publishers and other organisations, the Congress included a number of special days and events. Tuesday 8th was Industry Day, Wednesday 9th was Education Day, about which I comment more below. Thursday 10th was Community Day which featured a talk by Helaman and Claire Ferguson titled *Mathematics in Stone and Bronze*, about their sculptural work. More about Helaman's work can be seen at <http://www.helasculpt.com/>.

I was invited to participate in the embedded EMAC (Engineering Mathematics and Applications Conference) to present my work on the computer aided assessment system AIM. This system uses the Maple computer algebra system to aid the assessment of mathematics and has been described previously in [2]. My paper, [1], briefly discussed the system, and concentrated on a particular style of open ended questions. This was very well received and as a result of discussion with colleagues two institutions in Australia intend to install the system for use with their students. A number of others are seriously evaluating its potential and existing users at Perth and Curtin agreed at ICIAM to investigate the feasibility of a small scale Southern Hemisphere AIM conference during 2004.

Wednesday was Education Day and in addition to the usual Congress activities were special sessions specifically for high school teachers. For example, Hendrik Lanstra of UC at Berkeley talked about *Escher and the Droste Effect*, see <http://escherdroste.math.leidenuniv.nl/> There were also educational sessions of interest to University mathematicians. In particular Roger Sidje, University of Queensland organised a parallel session covering mathematics and the Web. This reported progress on MathML in particular which is now becoming used and supported by browsers and applications. I also attended the Plenary talk by Wilfried Schmid titled *How much*

mathematics in mathematics education. This talk discussed deficiencies in mathematics education identified in the 1980's, and the effect of remedies which were subsequently implemented.

I contributed a talk on my applied mathematics research which was unfortunately scheduled for Wednesday afternoon, and clashed with the Education Day open discussion. This was annoying, but with so many parallel sessions it is perhaps inevitable that I would miss something of interest during my talk. With so many presentations and parallel sessions the effect is somewhat overwhelming, and no one person can get more than a snapshot of the Congress. I certainly attended a good number of excellent contributed talks and invited plenary lectures. The Congress was also an opportunity to renew acquaintances and make new friends.

References

- [1] C J Sangwin. Assessing higher mathematical skills using computer algebra marking through AIM. In *Proceedings of the Engineering Mathematics and Applications Conference (EMAC03, Sydney, Australia)*, pages 229–234, 2003.
- [2] N Strickland. Alice interactive mathematics. *MSOR Connections*, 2(1):27–30, 2002. <http://ltsn.mathstore.ac.uk/newsletter/feb2002/pdf/aim.pdf> (viewed December 2002).

Conference Report: Psychology of Mathematics Education 27

Contributed by Chris Sangwin, University of Birmingham email: c.j.sangwin@bham.ac.uk

The 27th conference of the International Group for the Psychology of Mathematics Education, PME27, took place from 13–18 July 2003 at the Hawai'i Convention Center, Honolulu, USA. This incorporated a joint meeting of PMENA, the associated North American group. The conference opened on the Sunday with an address by Naiona Thompson, a navigator who has studied non-instrument navigation known as wayfinding. His work rediscovered the traditional Polynesian system of navigating on long distance ocean voyages. His voyage of the traditionally constructed double hull canoe, Hawai'iloa, in 1994 for example from Hawai'i to Tahiti took approximately 30 days. He is currently working to develop an educational program to preserve traditional Polynesian voyaging traditions. This might at first sight seem an unusual choice of keynote speaker at a mathematics conference, but his work as an educator is inspirational and his stories of the ocean journeys were fascinating.

The more serious scientific business of the conference commenced on Monday. The membership of PME is very diverse, from research psychologists and educationalists to research mathematicians. All levels of mathematics were represented, from pre-school and elementary through to university mathematics. University mathematics was very strongly represented and good educational research is clearly taking place in many university departments. Much of this research work is of direct interest to teachers in HE. PME is an ideal forum for such a wide range of interests to come together to share ideas, experiences and methodologies. Furthermore, it is an important opportunity for university mathematicians to engage in serious dialogue with mathematics educators and school teachers.

I selected those sessions which were devoted to Advanced Mathematics, that is to say those most relevant to University level material. For example, the working sessions on Symbolic Cognition run by Stephen Hegedus examined students interaction with computer algebra systems and the constraints that machine syntax imposed on students' thinking. As a concrete example, piecewise defined functions are often difficult, or unnatural to enter into a CAS. This working group is ongoing and more can be found at <http://merg.umassd.edu/symcog/>.

Delegates brought interesting international perspectives. Many countries share the same problems in the UK, with perceptions of declining standards and levels of participation. Others have very different problems: in the session on Equity, Mathematics Learning and Technology, one delegate reported on the nonsense of government initiatives which provide computer equipment to schools which don't have electricity or running water! The Pacific Island Scholars, from nations such as Republic of Palau, Guam, Chuuk and the Federated States of Micronesia, had problems of isolation and difficulties associated with small scale educational systems.

Delegates also showed an interest in the AIM computer aided assessment system on which I am working, and some are evaluating it with the intention of installing and using the system. I had useful discussions about how to develop both the system itself, and learning materials. This has evolved and I am about to embark on some joint research examining design of mathematical question sets, with particular reference to how one might produce randomly generated questions with a computer algebra system which preserve both mathematical, and educational aspects of the question itself.

New version of JISC Resource Guides

The new JISC Resource Guides were published on 7 October, providing free overviews of quality-assured information about electronic resources and support services, all of them selected by subject specialists. A copy of the Guide for Engineering, Mathematics and Computing is enclosed with this newsletter.

After extensive consultation with community representatives, including librarians, academics, researchers and students, as well as publishers and providers, the Resource Guides have been updated and improved. Improvements in the new edition include:

- Attractive full-colour booklet format
- New resource categories reflecting the needs of subject communities
- New and simpler definitions for accessing electronic resources
- Full information on search tips, training and support activities

Resources and services highlighted in the JISC Resource Guides are designed to support learning, teaching and research at all levels. Each Guide is compiled by a dedicated Resource Guide Adviser who selects the key resources for the subject area and presents them in both print and Web format. The Adviser for Engineering, Mathematics and Computing is Sarah Kelly (s.kelly@hw.ac.uk) and the web version can be found at <http://www.jisc.ac.uk/resourceguides/emc>